Pinyon Needle Scale

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The pinyon needle scale (*Matsucoccus acalyptus* Herbert) is a native sap-sucking insect found in the Southwest. Feeding by scales weakens trees by killing needles older than 1 year. Sometimes small trees are killed by repeated feeding and large trees weakened to such an extent that they fall victims to attack by the bark beetle *Ips confusus* (LeConte). Scale infestations and damage are especially serious on trees valued for shade or esthetics.

Range and hosts

The pinyon needle scale, one of several scale species infesting pinyon, was first described from single-leaf pinyon in southern Idaho. Infestations also occur on this tree in Utah and California. In California, it also attacks foxtail pine. In Idaho, Colorado, Arizona, and New Mexico, pinyon may sustain persistent infestations over wide areas.

Evidence of Infestation

Scales look like small, black, bean-shaped, motionless objects on the needles of infested trees (fig. 1). These fully grown immature scales are approximately 1.5 mm in length and 0.70 mm in width and thickness.

Repeated, heavy scale infestations leave the trees with only a few needles, clustered at the tips of branches (fig. 2). Needle length is greatly reduced.

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Figure 1.—Pinyon needle scales on year-old needles.

Life History

The life history of the scale was determined at Grand Canyon, Arizona, and Mesa Verde, Colorado. Some slight variations can be anticipated throughout its range.

During the latter half of April, wingless females back out of the waxy covering that sheltered the immobile second larval stage on the needle (fig. 3). While emerging, the females are mated by winged males, which can be seen in large

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Figure 2.—A pinyon that has been defoliated repeatedly by the pinyon needle scale.

numbers flying about the scale-infested trees. Mated females then crawl to one of several preferred oviposition sites, and lay oval clusters of yellow eggs that are loosely held together in thin sheaths of white cottony webbing. Egg masses are found (1) around the root collar, (2) in crotches of large branches, (3) along the undersides of large branches, and (4) in the fissures of rough bark (fig. 4).

In about 4 weeks, red eye spots become visible in the eggs, and in 7 to 10 days yellow crawlers emerge. The crawlers make their way to the ends of the branches and settle on needles formed the previous year. They generally aline themselves with their heads toward the base of the needles, insert their hair-like feeding tube into the soft needle tissue, become immobile, cover the body with wax, and turn black, all in about 1 day. Occasionally, some scales settle on the tips of new needles that are just expanding from buds (fig. 5). Female scales never move until the adult emerges.

When the first stage (fig. 5*B*) of the scale grows too large for its waxy shell, it makes a smooth rupture down the middle of the back and the second stage develops in place (fig. 5*C*). Most immature males emerge from the second stage in October or November. They have legs, and crawl to the ground where they spin loose, white, silken webs under sticks or pebbles and transform into the prepupal stage. In 3 to 4 days the prepupae moult within the cocoons and enter the pupal stage, where they spend the winter. A few males are retarded and do not go through these prepupal and pupal stages until March. The life history is completed in 1 year when recently emerged males mate with the emerging females in April.

Control

Natural.—Data on natural control agents are meager. Ants occasionally eat the immobile scales on needles, but this predation is probably ineffective in significantly reducing scale populations. As knowledge of this scale improves, other natural control agents may be found, but the long duration of infestations studied indicates that natural control agents are now generally ineffective in reducing scales below damaging levels.

Chemical.—The pinyon needle scale can be controlled on selected trees by spraying a dimethoate-water emulsion (3 gals. of a 30.5 percent emulsifiable concentrate per 100 gals water, approximately 1 percent) to egg masses at the base of the trees and to all bark and crotches that can be reached from the ground. Make this bark application when crawlers start to emerge from the eggs. Crawlers emerge about 7 to 10 days after red eye spots become visible in the eggs under a hand lens, normally in early June in northern Arizona-

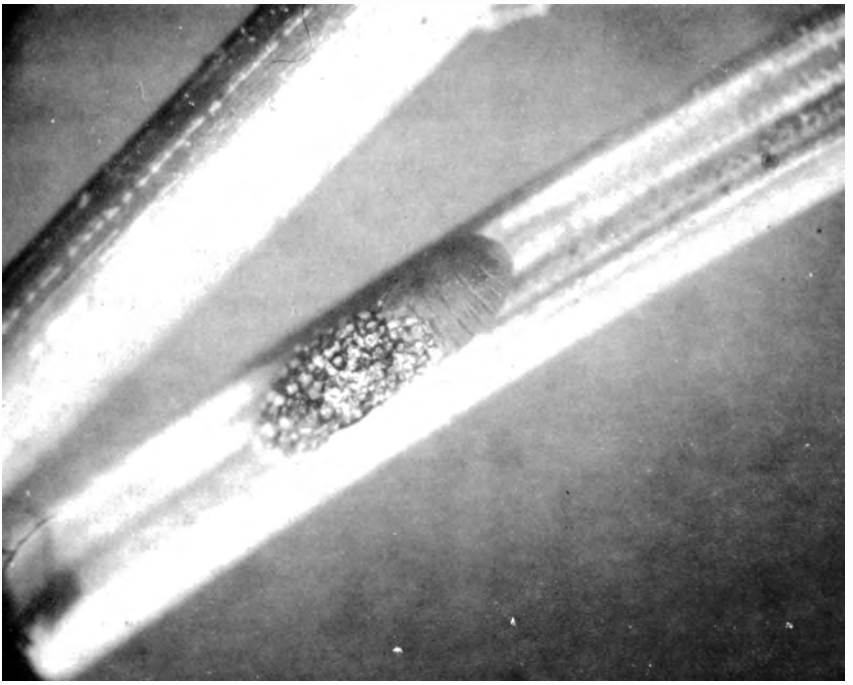

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Figure 3.—Mature female scale emerging from second larval stage.

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Figure 4.—Egg masses of the pinyon needle scale.

New Mexico and southwestern Colorado. Timing the spray application is critical for effective control. Use hydraulic or back-pack sprayer. Do not spray needles since phytotoxicity may result: Do not apply to pine trees used for pine nut or pinyon nut production.

Pesticide Precautions

Pesticides used improperly can be injurious to man, animals, and plants. Follow the directions and heed all precautions on the label.

Store pesticides in original containers under lock and key—out of the reach of children and animals —and away from food and feed.

Apply pesticides so that they do not endanger humans, livestock, crops, beneficial insects, fish, and wildlife. Do not apply pesticides when there is danger of drift, when

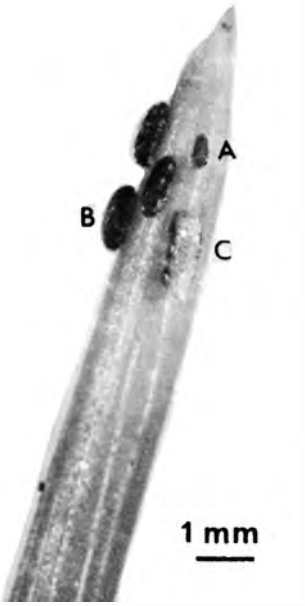

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Figure 5.—Immature stages of pinyon needle scale: *A*, First larval instar settled on needle; *B*, mature first larval instar; *C*, second larval instar.

honey bees or other pollinating insects are visiting plants, or when they may contaminate water or leave illegal residues.

Avoid prolonged inhalation of pesticide sprays or dusts; wear protective clothing and equipment if specified on the container.

If your hands become contaminated with a pesticide, do not eat or drink until you have washed. In case a pesticide is swallowed or gets in the eyes, follow the first aid treatment given on the label, and get prompt medical attention. If a pesticide is spilled on your skin or clothing, remove clothing immediately and wash skin thoroughly.

Do not clean spray equipment or dump excess spray material near ponds, streams, or wells. Because it is difficult to remove all traces of herbicides from equipment, do not use the same equipment for insecticides or fungicides that you use for herbicides.

Dispose of empty pesticide containers promptly. Have them buried at a sanitary land-fill dump, or crush and bury them in a level, isolated place.

Warning: Recommendations for use of pesticides are reviewed regularly. The registration on the suggested use of the pesticide in this publication was in effect at press time. Check with your county agricultural experiment station or local forester to determine if these recommendations are still current.

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